

# Section 1: Executive Summary

Working under the adaptive management concept, the Binational Executive Committee (BEC) recommended that a LaMP be produced for each lake by April 2000, with updates every two years thereafter. Consistent with the BEC resolution, the Lake Erie LaMP 2000 was presented in a loose-leaf format, with general tabbed sections, that could be inserted into a three-ring binder. This format allows the LaMP to be viewed as a working document, easily adding new material and removing outdated information as needed.

It is important to understand that the Lake Erie LaMP is a management plan and not a state of the lake report. Biennial updates are meant to measure the progress under the LaMP work plan or present the results of research or assessment reports that were undertaken or initiated by or in collaboration with the Lake Erie LaMP. This revised document does not include reference to all actions that have occurred in the Lake Erie watershed since the 2004 report.

The Lake Erie LaMP has compiled and assessed a significant amount of information to determine the current problems in the lake, their sources, and the ecosystem objectives that must be achieved if the Lake Erie LaMP vision is to be obtained. It is now time to focus on implementation. What actions or programs are most important to protect and restore the lake? Who has the authority to implement those actions? Is additional funding needed and, if so, where will it come from? Is the LaMP management structure sufficient to achieve the Lake Erie vision? The LaMP work plan for the next two years will address these questions.

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Photo: Upper Thames River Conservation Authority

The Lake Erie LaMP must finalize measurable indicators that identify the current state of the ecosystem relative to the desired state of the ecosystem, as described by the Lake Erie Vision and ecosystem management objectives. The Indicators Task Group has prepared an indicator matrix to better understand and organize the application of the proposed indicators. The matrix structure is based on the five habitat zones identified for the Lake Erie basin. The indicators are divided into two categories: pressure (including the management objectives and processes) and state. The matrix has been populated by candidate indicators proposed by respondents to a questionnaire. The next step is to refine the list of candidate indicators using selection criteria defined by the Task Group. The result will be a suite of indicators that meet the needs of the Lake Erie LaMP.

Concentrations of selected contaminants in bed sediment were further summarized. Results support the understanding that high levels of trace element and PAH contamination are not systemic throughout the basin (in both tributaries and open lake), but co-located with source areas such as urban-industrialized areas, creosote production and petroleum processing and refining. Median concentrations for all the trace elements were below threshold effect concentrations (TEC). Organochlorine pesticides (DDT, dieldrin, mirex, lindane, chlordane, hexachlorobenzene) and PCBs continue to persist in the sediments although they are detected less frequently than trace elements or PAHs. Localized high concentrations of these chemicals exist, but the median concentration never exceeded TEC.

Although considered inadequate to calculate total loadings to the Lake Erie Basin, evaluation of the U.S. Toxic Release Inventory (TRI) and the Canadian National Pollutant Release Inventory (NPRI) was done to estimate the amount of mercury released in the basin and the top contributing sources. From 1995 to 2003, over 69,000 kg (151,800 lbs) of mercury were reported released, primarily to air and onsite landfills or transferred to offsite sewage treatment plants. Waste management companies, electric services and chlor-alkali plants were the main contributors. Estimates for PCBs were done only for the U.S. as PCBs are not reported to the NPRI. For the same time period, over 758,000 kg (1.7 million lbs) of PCBs were released, 99% of which went to onsite landfills. The top contributor was waste management companies.

Per the recommendations of the Lake Erie LaMP Habitat Strategy, a project is underway to develop a unified, consensus-based habitat classification system and an associated geospatial database that integrates classification systems at relevant scales into map layers. The goal is to create a binational GIS-based habitat map. Several workshops have been held to involve the technical experts and managers. Testing and validation is planned for the Maumee River and Grand River watersheds, after which the project will be expanded to the rest of the Lake Erie basin.

Other habitat projects underway include: an assessment of coastal wetlands around Rondeau Bay (Ontario Ministry of Natural Resources); the Fort Malden shoreline stabilization/habitat enhancement project and the McKee Park habitat enhancement project (Essex Region Conservation Authority); and the Middle Harbor fish habitat restoration project (Ohio Department of Natural Resources). The Huron-Erie Corridor system habitat assessment is creating a framework and designing a process to identify, coordinate and implement aquatic habitat restoration opportunities in the Lake Huron to Lake Erie Corridor. The Huron-Erie Corridor project is being conducted within the context of long-term water level regime changes resulting from direct hydro-modification and/or potential effects of global climate change. USGS completed the Ohio Aquatic GAP analysis project in 2005. Seventy-five (15%) of 504 14-digit hydrologic sub-watershed units in the Lake Erie basin were identified as having high potential for priority conservation. Thirty-seven of the 75 sub-watersheds already include some conservation lands within their boundaries.

From a human health perspective, as required by legislation passed stemming from the Walkerton, Ontario situation, watershed plans to protect drinking water sources are being developed in Ontario. On the U.S. side, the passage of the Beaches Environmental Assessment and Coastal Health Act (BEACH Act) in 2000 has done much to standardize criteria for beach postings, improve sampling methodology and frequency, and improve communication to the public concerning the water quality at public beaches. In 2005, 33 of the 66 beaches monitored along the U.S. shoreline had at least one day when beaches were posted.

Updates are included on the progress of 12 RAPs and seven watershed initiatives around Lake Erie. Each update provides a short history of the process and past actions, progress since the 2004 LaMP report and next steps. A matrix summarizing each area is included for the first time. These reports indicate continuing interest and participation in RAP and watershed programs. The involvement of local groups and agencies is a critical component in the success of restoring beneficial uses to these areas and to ultimately reduce impacts on the lake.

Since the late 1970s, concentrations of PCBs, DDT and mercury have generally declined in Lake Erie walleye, smelt and lake trout, although a fair degree of variability is seen from year to year. Over the sampling period, no fish have ever exceeded GLWQA criteria for DDT

or mercury (1.0 µg/g and 0.5 µg/g, respectively). PCBs in walleye and lake trout consistently exceed the GLWQA of 0.1 µg/g, while rainbow smelt hover near or below the criteria.

Photo: Upper Thames River Conservation Authority



In the last decade, in-lake concentrations of phosphorus have been on the rise. Hypoxia and anoxia in the central basin are more extensive and occurring earlier in the summer, while *Microcystis* blooms and *Cladophora* growth have been observed recently to rival those of the 1970s. These signs all suggest that Lake Erie is out of trophic control once again. Lake Erie was monitored in 2004 under the U.S and Canada collaborative comprehensive survey (ECCS) with the next round planned for 2009. Sampling was focused on observing key physical and water quality measurements, nearshore/offshore exchanges and the impacts of zebra and quagga mussels. In 2005, under the International Field Year on Lake Erie (IFYLE) program, research/monitoring was done to gather information to help forecast the onset, duration and extent of hypoxia and harmful algal blooms across the basin and to assess the ecological consequences of hypoxia on the food web. While the results of these studies are still forthcoming, many hypotheses implicate zebra and quagga mussels as a major cause of the lake's current problems. Long-term tributary monitoring work conducted by the National Center for Water Quality Research at Heidelberg College suggests a trend of increasing concentrations and loads of sediments and nutrients from the monitored tributaries in Michigan and Ohio. Of particular interest is the increase in the amount of dissolved reactive phosphorus as it is the most bioavailable form of phosphorus.

In the fall of 2005, hydrogen sulfide gas was released from the hypolimnion during the fall turnover. The extent of this release ranged from Cleveland to Buffalo and was so pervasive as to be investigated by emergency response teams in Pennsylvania as a gas leak, sewage discharge or chemical explosion. However, monitoring buoys installed by NOAA under IFYLE verified that this was indeed a phenomenon associated with lake turnover. Under the appropriate weather conditions, and if anoxia continues to move closer to shore, we can anticipate seeing this situation repeat itself more frequently.

The Lake Erie LaMP process is changing from assessment to implementation. For the next two years the LaMP will be reviewing its management structure and better identifying those actions that need to be taken on a lakewide basis or at the watershed level to obtain the ecosystem objectives set by the LaMP.

